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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/811,465 | 03/20/2001 | Yuichi Takano | 08372.0002 | 7960 |

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EXAMINER

HASSANZADEH, PARVIZ

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1763

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/811,465

Applicant(s)

TAKANO ET AL.

Examiner

Parviz Hassanzadeh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) 1-3 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-4 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-3, drawn to a product (glass), classified in class 501, subclass 54.
- II. Claim 4, drawn to an apparatus (plasma processing apparatus), classified in class 146, subclass 345.41.

The inventions are distinct, each from the other because of the following reasons:

Inventions Group I and Group II are related as sub-combinations disclosed as usable together in a single combination. The sub-combinations are distinct from each other if they are shown to be separately usable. In the instant case, invention Group I has separate utility such as in construction of discharge tube. See MPEP § 806.05(d).

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with David Hill on 10/22/02 a provisional election was made with traverse to prosecute the invention of Group I, claim 4. Affirmation of this election

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must be made by applicant in replying to this Office action. Claims 1-3 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: "4a" and "4b" shown in Fig. 4. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mabuchi et al (JP 10-214823 A) in view of Nagahama et al (JP 11-228172 A).

Mabuchi et al teach a microwave plasma processing apparatus (Fig. 1) including a microwave transmitting window 14 made of a dielectric material such as quartz glass or alumina (abstract and paragraphs 0018-0023).

Mabuchi et al fail to teach the dielectric being made of a glass comprising a first phase comprising (consisting essentially of) Si and O and a second phase comprising (consisting essentially of) Si, Al and O wherein the second phase has a mass ratio of Al to Si of at least 0.01.

Nagahama et al teach a glass comprising (consisting essentially of) SiO₂ as the main component and incorporated therein 0.01-10 atomic % Al which has high resistance to plasma corrosion (abstract, paragraphs 0010-0020).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to employ the glass material as taught by Nagahama et al in the microwave

transmitting window of Mabuchi et al in order to render the microwave transmitting window more resistance to plasma corrosion.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mabuchi et al (JP 10-214823 A) in view of Rittler (US Patent No. 4,009,042).

Mabuchi et al teach a microwave plasma processing apparatus (Fig. 1) including a microwave transmitting window 14 made of a dielectric material such as quartz glass or alumina (abstract and paragraphs 0018-0023).

Mabuchi et al fail to teach a the dielectric being made of a glass comprising a first phase comprising (consisting essentially of) Si and O and a second phase comprising (consisting essentially of) Si, Al and O wherein the second phase has a mass ratio of Al to Si of at least 0.01.

Rittler teaches a glass-ceramics comprising (consisting essentially of) 50-65% quartz (SiO_2) and 20-30% alumina (Al_2O_3) as the major components of a predominant beta-phase as shown in Table 1 in order to obtain a transparent glass-ceramics with low coefficient of expansion and good transparency (abstract and column 7, line 34 through column 8, line 34).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to employ the glass material as taught by Rittler in the microwave transmitting window of Mabuchi et al as an art recognized equivalent alternative for the microwave transmitting window which has a lower thermal coefficient and higher resistance to plasma corrosion.

See MPEP 2144.06, Art Recognized Equivalent for the Same Purpose, Substituting Equivalents Known for the Same Purpose (*in re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982)).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mabuchi et al (JP 10-214823 A) in view of Prochazka (US Patent No. 4,266,978).

Mabuchi et al teach a microwave plasma processing apparatus (Fig. 1) including a microwave transmitting window 14 made of a dielectric material such as quartz glass or alumina (abstract and paragraphs 0018-0023).

Mabuchi et al fail to teach a the dielectric being made of a glass comprising a first phase comprising (consisting essentially of) Si and O and a second phase comprising (consisting essentially of) Si, Al and O wherein the second phase has a mass ratio of Al to Si of at least 0.01.

Prochazka teaches a glass-ceramics (mullite) comprising (consisting essentially of) quartz (SiO_2) and alumina (Al_2O_3) wherein when the ratio of the components change separate mineral phases are produced (column 2, lines 39-64).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to employ the glass material as taught by Prochazka in the microwave transmitting window of Mabuchi et al as an art recognized equivalent alternative for the microwave transmitting window which is known to have a higher resistance to plasma corrosion.

See MPEP 2144.06, Art Recognized Equivalent for the Same Purpose, Substituting Equivalents Known for the Same Purpose (*in re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982)).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al (US Patent No. 6,277,251 B1) in view of Prochazka (US Patent No. 4,266,978).

Hwang et al teach a plasma processing apparatus (Fig. 14B) including an electromagnetic wave transmitting liner 11 made of a dielectric material such as quartz, alumina or *aluminum silicate* (column 11, line 53 through column 12, line 36).

Hwang et al fail to teach a the *aluminum silicate* being made of a glass comprising a first phase comprising (consisting essentially of) Si and O and a second phase comprising (consisting essentially of) Si, Al and O wherein the second phase has a mass ratio of Al to Si of at least 0.01.

Prochazka teaches a glass-ceramics (mullite) comprising (consisting essentially of) quartz (SiO₂) and alumina (Al₂O₃) wherein when the ratio of the components change separate mineral phases are produced (column 2, lines 39-64).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to employ the glass material as taught by Prochazka in the electromagnetic wave transmitting liner of Hwang et al as an art recognized equivalent alternative for the microwave transmitting window which is known to have a higher resistance to plasma corrosion.

See MPEP 2144.06, Art Recognized Equivalent for the Same Purpose, Substituting Equivalents Known for the Same Purpose (*in re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982)).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Prochazka et al (US Patent No. 4,427,785) teach an optically translucent ceramic comprising SiO₂ and Al₂O₃ (abstract); and

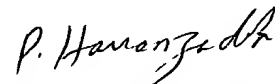
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Otoshi et al (US Patent No. 5,637,358) teach a microwave window 102 including a movable dielectric sheet 121 made of ceramics containing aluminum oxide or/and silicon oxide (column 5, lines 57-67.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (703)308-2050. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on (703)308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.



Parviz Hassanzadeh
Examiner
Art Unit 1763

November 1, 2002